

able, and has obviously proved a stumbling-block to the Marconi Company, as it forms the subject-matter of two or three patents taken out by Prof. Fleming and the Company. Some of the methods described therein are exceedingly ingenious, but, unfortunately, space does not allow us to describe them here, especially as their bearing on wireless telegraphy is only indirect.

With the exception of the magnetic detector devised by Mr. Marconi and tested during the cruise of the *Carlo Alberto*, practically all the different systems make use of the coherer principle for receiving. The actual type of coherer used differs considerably in the several cases. For long-distance work, it has generally been found most suitable to use a coherer which requires no tapping back, but spontaneously returns to its normal condition, this being connected in parallel with a telephone. One of the chief advantages of this arrangement lies in the fact that the energy required to give audible signals in the telephone is much less than that needed to work a relay. There are several different coherers working on this principle—the principle really of the microphone; in the system devised by M. Popoff, carbon granules form the loose contacts, the resistance, which is normally high, being broken down by the received waves and the coherer then restoring itself to its original condition; the change

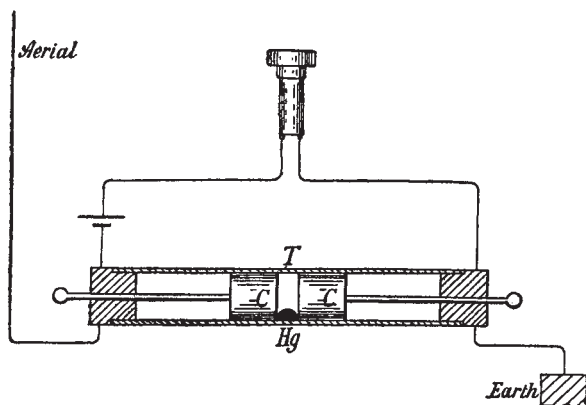


FIG. 2.—Castelli Coherer and Connections.

in the current through the coherer causes a click in the telephone. In the de Forest system, an electrolytic "anticoherer" is used; this has a paste, composed of a viscous material, loose conducting particles and an electrolyte, between suitable electrodes. In the normal condition, the conducting particles bridge the gap and give the receiver a low resistance; electrolysis is set up by the received oscillations and the consequent polarisation greatly increases the resistance. Of the coherers of this type, the greatest interest attaches to the Castelli coherer. This, invented by a semaphorist in the Italian navy, was used by Mr. Marconi in his first Transatlantic experiments. Its construction is shown in Fig. 2. Two iron or carbon electrodes, C C , fit into the tube T and are connected by a single drop of mercury Hg . The connections shown are, of course, the same in the case of the two other coherers just described. When electrical oscillations reach the tube, the mercury coheres to the electrodes, but returns at once to its normal condition when the stimulus ceases. The magnetic detector to which we have made reference above was described by Mr. Marconi in a paper read before the Royal Society last June. Fig. 3 shows the principle of its construction. It consists of a core of thin iron wires, I , over which are wound two coils of fine copper wire, C_1 and C_2 . The outer core, C_1 , is connected to a telephone receiver and the inner, C_2 , to the aerial and earth or to the secondary of a transformer the primary of which is connected to the aerial

and earth. The iron core is magnetised by a permanent magnet, M , at one end, which is rotated by clockwork so as to produce a continual slow change in the magnetisation, which, however, owing to the hysteresis, lags behind the magnetising force. When oscillatory currents pass through the inner coil, there is a sudden decrease in the hysteresis, due apparently to the molecules being released from restraint; a corresponding sudden variation in the magnetisation of the iron results, and this induces a current in the outer winding connected to the telephone.

Such, in brief, are the more important advances that have been made in the practice of wireless telegraphy during the past year. In addition, much work has been done on the purely scientific side of the subject, the action of the coherer in particular having been submitted to somewhat rigorous examination, work which has already produced results which may prove both of great physical and great practical value. It may fairly be said that we know now, with a considerable degree of certainty, some of the more useful services which wireless telegraphy may be relied upon to perform. Already its commercial application is considerable; many ships, in the navies of this and other countries and in the merchant services, are equipped with wireless telegraphic apparatus which has, we believe, fully justified its instal-

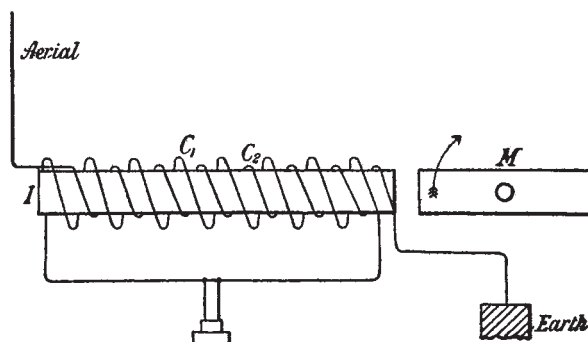


FIG. 3.—Diagram of Marconi's Detector.

lation. It is in this direction that we look with the most confidence for a steady increase in its application, and we would rather hear of a few more ships being thus equipped than of another "S" being transmitted across the Atlantic.

MAURICE SOLOMON.

NOTES.

THE Paris correspondent of the *Times* announces the death of M. Dehérain, professor of vegetable physiology in the Museum of Natural History, and of M. Hautefeuille, mineralogist at the Faculty of Sciences. Both were members of the Paris Academy of Sciences. The death is also announced of M. Alexandre Bertrand, one of the original founders of the fine museum of St. Germain, of which he had been curator since 1862. He was also professor at the École de Louvre of national archaeology, and his fame as an archæologist was world-wide.

THE great dam on the Nile at Assuan is to be inaugurated by the Duke and Duchess of Connaught as we go to press with this number. Sir Benjamin Baker, K.C.M.G., has been appointed to be a Knight Commander of the Order of the Bath, in recognition of his services in connection with the construction of the Nile reservoir. Other honours conferred in connection with the work are:—To be G.C.M.G., Sir William Edmund Garstin, K.C.M.G., Under-Secretary of State for Public Works in Egypt. To be K.C.M.G., Major R. H. Brown, R.E., C.M.G.,

and Mr. W. Willcocks, C.M.G., of the Egyptian Irrigation Department. To be C.M.G., Mr. A. L. Webb, Mr. K. E. Verschöyle, Mr. M. Fitzmaurice and Mr. G. H. Stephens.

THE suggestion that the British Association should meet in South Africa in 1905 was mentioned in these columns some time ago. The following statement with reference to the meeting has now been published in the daily papers :—Reuter's Agency is informed that the suggestion that the British Association should hold its annual meeting for 1895 in South Africa emanated from the new South African Association of Science, of which Sir D. Gill, Astronomer Royal for the Cape, is president. Before the last meeting of the British Association at Belfast, invitations were sent from the municipalities of Cape Town, Kimberley, Bulawayo and other centres in South Africa, and it is understood that these have been accepted, and that the session of 1905 will be held in South Africa. Scientific papers will be read at various centres in the South African Colonies, and visits will be paid to various places of interest. A sum of 7000*l.* has been collected in South Africa for the entertainment of the Association. While in Rhodesia, the men of science will be the guests of the Chartered Company, who will place the railways at their disposal and, among other things, take them by special train to the Zambesi, where they will stay at the new hotel to be erected near Victoria Falls. Probably the guests will leave England in a special steamer.

AT the meeting of the Royal Geographical Society on Monday, Dr. Sven Hedin described to a large audience the results of his explorations in Central Asia during the three years 1899–1902. Before the reading of the paper, it was announced that Dr. Sven Hedin had been awarded the Victorian medal of the Society for geographical survey. The scientific records and other material obtained during the expedition are of great value, and include some interesting evidence of secular movements in the region of Lop-nor. The surface of the lake of Kara-koshun was found to be about seven-and-a-half feet below the northern shore of the ancient lake of Lop-nor. The lake of Kara-koshun is gradually disappearing in the place where Prjevalsky found it, and slowly creeping northwards towards its ancient bed, where Dr. Hedin believes it will be found at no great distance of time. The lake is getting choked with mud and drift-sand and decaying vegetable matter; while, on the other hand, the northern part of the desiccated desert is being eroded and furrowed by the winds, and is thus growing deeper and deeper every year. As the lake moves, so do the vegetation and the various animals of the desert. They, as well as the fisher-folk, with their reed huts, follow after to the new shores, while the old lake gradually dries up. There are reasons for believing that in the far-off future the same phenomena will recur again, but in the reverse order, though the natural laws which will effect the reversal will remain precisely the same. Whenever that occurs it will be possible to determine the length of time required for these periodic changes. Dr. Hedin pointed out, however, that it is already known that in the year 265 A.D. the lake of Lop-nor lay in the northern part of the desert. Lop-nor is, as it were, the oscillating pendulum of the Tarim River, and each oscillation probably extends over a space of a thousand years or more.

THE following men of science have been elected honorary members of the Cambridge Philosophical Society :—Prof. Bayley Balfour, A. H. Becquerel, E. Fischer, Richard Heymons, J. H. van't Hoff, M. Jordan, H. F. Osborn, W. K. von Röntgen, Corrado Segre and Hugo de Vries.

THE Antarctic relief ship *Morning*, carrying provisions for the *Discovery*, now in Antarctic regions, sailed from Wellington, New Zealand, on December 6.

NO. 1728, VOL. 67]

THE *Times* correspondent at St. Thomas, in a message dated December 6, reports that Mont Pelée has been dangerously active during the past week. There has been a heavy fall of ashes, and vessels were advised not to approach the coast.

AN ascent of the Soufrière while still in a state of activity was made, on October 28, by Mr. J. P. Quinton, of the Botanic Station of Sierra Leone. Mr. Quinton and his party were the first to try the ascent since the eruption of October 15–16. Some of the ridges they had to cross were not more than six inches wide, with a fall of a thousand feet on either hand. The ascent took two and a half hours stiff climbing. Mr. Quinton found that the new crater had unwarrantably been held responsible for the mischief of October 15; only the old crater was doing anything. This was discharging volumes of steam and water, and was throwing stones and ashes to a height of 30*ft.* or more. But no lava at all seems to have been ejected. The steam comes up through a fissure in the south wall of the crater, hangs along in a depression close in under the south-eastern wall, and, finally gaining the summit, is blown over to the west, making it look as though it were coming from the new pit. The old crater is very much wider than it used to be and more funnel-like. Red-hot stones and ashes are piled up on all sides—in some places over the rims. All through the night and the following morning while the party was on the mountain, rumbling sounds were constantly emitted, with clouds of steam and showers of ashes.

A *Times* correspondent describes the recent eruptions in Guatemala as communicated to him by a resident in the republic. On October 24, at about 5 p.m., a violent eruption took place in the ravine which divides the volcano of Santa Maria from that of the Siete Orejas. At 5 a.m. on October 25, subdued noises were heard, emanating apparently from the direction of Quezaltenango. Later on the detonations grew louder. At 6 p.m. the eruption reached its climax. For about an hour the detonations had ceased, when, by a terrific outburst, the whole of the capital was thrown into a panic and everybody rushed out into the streets. This cannonade lasted for ten minutes, during which time the strongest built houses shook violently. At intervals the detonations continued through the night and in a less degree afterwards. The explosions were heard in the south of Nicaragua, and a telegram was received from San Salvador stating that the inhabitants had rushed into the streets in terror on hearing the noise. Quezaltenango was thirty-six hours in total darkness, during which time a heavy rain of ashes and sand had been falling. The manager of the Sabinas Estate, which lies just above the scene of the eruption, says that at about 5 o'clock on October 24 they were alarmed by a series of earthquakes of a throbbing nature, which appeared to come from below them. Almost simultaneously, a cloud of steam was seen to issue from the ravine already mentioned, about a league away. Soon ashes and sand, accompanied by small stones, commenced falling, and two hours later the odour of sulphur and gases was so great that he could hold out no longer, and he left on foot for Retalhuleu, a distance of some thirty miles. Reports from the other planters confirm the fear that the whole of the Costa Cuca, probably the richest coffee zone in the country, is totally ruined.

AMONG the lectures to be delivered at the Royal Institution before Easter, we notice the following :—Prof. H. S. Hele-Shaw, six lectures (adapted to young people) on locomotion, on the earth; through the water; in the air (experimentally illustrated); Prof. Allan Macfadyen, six lectures on the physiology of digestion; Sir William Abney, three lectures on recent advances in photographic science; Sir Robert Ball, three lectures on great problems in astronomy; Mr. A. J. Evans, three lectures on pre-Phoenician writing in Crete and its bearings on

the history of the alphabet; Sir Clements Markham, three lectures on Arctic and Antarctic exploration; Mr. G. R. M. Murray, three lectures on the flora of the open ocean; and six lectures by Lord Rayleigh. The Friday evening meetings will begin on January 16, when a discourse will be delivered by Prof. Dewar on low temperature investigations; succeeding discourses will probably be given by Dr. Tempest Anderson, Prof. W. E. Dalby, Prof. S. Delépine, Principal E. H. Griffiths, Dr. A. Liebmann, Prof. J. G. McKendrick, Prof. Karl Pearson, Prof. E. A. Schäfer, Prof. W. A. Herdman and Lord Rayleigh.

AFTER the formal acceptance, by the British Government, of the invitation to take part in the Universal Exhibition which is to be opened at St. Louis on May 1, 1904, it was decided to prepare and distribute an illustrated descriptive pamphlet for the guidance of intending exhibitors and visitors from the United Kingdom. The booklet sets forth the plan of the Exposition, gives estimates of the men and the historic events to be commemorated, provides a comprehensive review of the various exhibits, and explains the relations which foreign countries, the Government of the United States and the States of the Union bear to it. About twenty-five foreign countries, including Great Britain, France, Germany and Italy, have decided to take part in the Exhibition. France has already made a preliminary appropriation of 650,000 francs, and it is believed this will be at least doubled next year. Germany's exhibit is expected to be even finer than that at the last Paris Exhibition. Japan has made an initial grant of 800,000 yen (about 80,000*l.*). The British Government is to be asked, a *Times* correspondent says, to enlarge the scope of its acceptance, which is limited thus far to the assurance that complete exhibits will be made in art and education, and facilities afforded to industries.

ON Monday, at the Society of Arts, Sir George Birdwood, K.C.I.E., was given evidence of the regard in which he is held by many leaders of thought, for he was presented with a testimonial in the form of some handsome silver plate and a purse of money. In making the presentation on behalf of the committee and subscribers, Sir Owen Tudor Burne alluded to the fact of Sir George Birdwood's having entered the East India Company's service forty-eight years ago. Being afterwards stationed at Bombay, he became one of its leading citizens, founding, among other beneficial works, the Victoria and Albert Museum and the Victoria Gardens, besides greatly enlarging the local branch of the Royal Asiatic Society and throwing open its membership to public-spirited and learned Hindus, Mohammedans and Parsees; he was mainly instrumental in raising the necessary funds for the building and endowment of the Bombay University, and was also the author of various writings on Indian art and botany and Indian local and Imperial questions.

THE bending of two alabaster slabs in the Alhambra palace at Grenada was mentioned by Mr. Spencer Pickering (p. 81) in connection with a letter by Dr. See (p. 56) on the bending of a marble slab under its own weight. Dr. Bleekrode, writing from The Hague with reference to the Alhambra slabs, remarks that they are nearly 3 metres long, and are 23 centimetres wide and 5 centimetres thick. The curvature begins at a distance of about 1 metre above the floor and the radius is nearly 9 metres. The pressure is estimated to be equal to about 1600 kilogrammes. Dr. Bleekrode points out that the Alhambra was built at the end of the thirteenth century and began to deteriorate nearly two hundred years ago. He suggests that possibly if the masonry causing the pressure were removed, the slabs would become flat again, in which case the bending would have to be regarded merely as an effect of elasticity.

NO. 1728, VOL. 67]

DR. T. A. JAGGAR, JUNR., of Harvard University, in a letter to *Science*, directs attention to a peculiar sequence followed by the great eruptions of Mont Pelée this year. Since May 5, eruptions of the first magnitude have occurred at intervals of increasing length, as will be noticed from the following dates of violent disturbances of the volcano:—May 5–May 8 three days; May 8–May 20, twelve days; May 20–June 6, seventeen days; June 6–July 9, thirty-three days; July 9–August 30, fifty-two days. The progressive increase of the interval between the eruptions does not follow any simple arithmetical law, but from a graphic representation of the facts a curve is obtained which suggests that the interval after August 30 has a length of 112 days. If that is the case, a great eruption of Mont Pelée might be expected to occur about December 20.

DURING the past week, this country has experienced abnormally cold weather, and sharp frosts have occurred at night, while the day temperatures have on several occasions only risen slightly above the freezing point. North-easterly and easterly winds have for the most part prevailed, and at times they have blown with considerable strength; snow has fallen in many places, and in the south of England the ground remained covered for some days. The cold spell has been caused by the extension of the European area of high barometric pressure over our Islands, and this has brought this country under the influence of the severe weather which has prevailed on the continent. On the night of December 6–7, the thermometer at Greenwich fell to 24°·5 in the screen and to 18°·7 on the grass, but still lower temperatures have been recorded in parts of England and Scotland. The anticyclone over northern Europe has apparently become fairly well established, and with its continuance the weather is likely to remain cold.

WE have received from Dr. Hergesell, president of the International Aeronautical Committee, a preliminary report upon the scientific balloon ascents made on the first Thursday in each of the months July, August and September last. The ascents, which were made by manned and unmanned balloons and kites, were joined in by Austria, France, Germany, Hungary and Russia on the continent, by England (Mr. Alexander), Scotland (Mr. Dines), and Blue Hill Observatory, in the United States. Readings at altitudes near or exceeding 10,000 metres were obtained in the following cases:—Berlin (July), –52°·5 C. at 15,690m., ground temperature 9°·4. Strassburg (August), –41°·7 at 10,160 m., temperature at starting 18°·4, and about half an hour later (5h. a.m.), –53°·1 at 11,900m., ground 16°·2. Berlin, –68° at 18,500m., ground 13°·5. Bath, –47°·2 at 9305m., temperature at starting (8h. a.m.) 15°·6; the greatest height reached was 11,350m. Strassburg (September), –54°·7 at 12,200m., ground 17°·7. Pavlovsk, –49°·7 at 11,100m., temperature at starting 13°. The ascents were made under the following barometric conditions:—In July, high pressure existed over the western part of Europe; in August and September, areas of low barometric pressure were prevalent.

WE have received from Dr. Robert Bell, acting director of the Geological Survey of Canada, the western sheet of the geological map of the Dominion, on a scale of fifty miles to an inch. It is very clearly printed in colours, and will be of much service as an index map to the structure of the country.

IN an article on the composite gneisses in Boylagh, West Donegal (*Proceedings Royal Irish Academy*, vol. xxiv., 1902), Prof. G. A. J. Cole argues that we have the intermingling and incorporation of two dissimilar masses of stratified and igneous material, and that the gneisses have resulted from the complex metamorphism to which the masses have been subjected.

MR. R. T. HILL (*Journal* of the Franklin Institute, August-October) gives a graphic account of the Beaumont oil-field, a district within the area of the coast prairie of the Texas, Louisiana and Mexican region. The oil was discovered in 1901 by a drill-hole through 1100 feet of clay and quicksand. A year later there were 136 wells, now there are 214, and more are being drilled. During the first year, $5\frac{1}{2}$ million gallons of oil were obtained, and five or six times this amount is estimated as the product for 1902. The prairie land extends for nearly 400 miles along the Gulf of Mexico and from ten to fifty miles inland. The strata at a depth probably comprise bituminous Eocene clays, and they are overlaid by later Tertiary and Pleistocene sands and clays, nearly 3000 feet in thickness, which contain the oil; and these, again, are covered by prairie deposits of sea-mud and sand. A drill-hole has been carried to a depth of 3050 feet without touching the Eocene. In some localities, hot water has been struck below the oil, and the oil itself is sometimes hot. Gas has been encountered in some of the bore-holes. It is remarked that the water becomes not only hotter but more saline with increasing depth, thereby raising its capacity for the collection and flotation of oil, which is preserved in the porous strata overlying the Eocene clays and is sealed up by the superincumbent muddy sediments.

PROF. O. COMES, of Portici, Naples, has prepared a series of chronological charts which furnish data concerning the introduction, cultivation and general spread of tobacco for all important countries throughout the world.

WITH the present contribution (No. 13), Sir George King has brought the "Material for a Flora of the Malayan Peninsula" to the end of the Calycifloræ. The genus *Begonia* furnishes 19 species, of which 14 are new to science; most of these were collected in Perak, several at altitudes varying from 3000 to 7000 feet. Two new species of *Mastixia* are also described. As in the case of the Thalamifloræ and Discifloræ, a complete list of Calycifloral species has been published separately.

THE possibilities of pitcher plants as a trap for catching the American cockroach, *Blatta americana*, are pointed out in the October *Bulletin* of the Trinidad Botanical Department. Planted amongst orchids, they may materially help the cultivator to keep this pest in check, and are more especially suitable since they require similar conditions of heat and moisture. A note on the "Nitrogen Content of Flowers" emphasises the manurial value of those of the Immortelle, and Nicaragua shade plants which are sown amongst cacao plants. A new fruit obtained from the Bocas Islands and provisionally determined by the Kew authorities as *Ananomis esculenta*, judging from its flavour and aroma, seems likely to furnish good table fruit.

THERE is a strong physiological tendency displayed in the *Bulletin* of the College of Agriculture connected with Tokyo University. Several papers by Mr. K. Aso deal with the action of certain poisonous substances when supplied as food to seedlings. Salts of manganese, even in weak solutions, have an injurious effect, but if the solution is diluted to contain about 0.002 per cent. of the salt, then the result is stimulating. Similar stimulating effects were obtained with very dilute solutions of other poisonous salts. The same author contributes a suggestive paper on the oxidising enzymes in plants. Mr. M. Toyonaga, on the animal side, obtains results which are in keeping with Prof. O. Loew's hypothesis that the amount of calcium varies with the size of the nucleus.

WE have received a copy of vol. v. No. 1 of the *Bulletin* of the College of Agriculture at Tokio, which, among other contents, includes a memoir on the embryology of silkworms, by Mr. K. Toyama.

IN the November issue of the *American Naturalist*, Prof. B. Dean continues the discussion of the origin of vertebrate limbs—this time from the point of view of the flotation and balancing of the body in the sharks. It is concluded that the pectoral, and not the pelvic, fins have shifted their position with the advance of development, in accordance with the exigencies of the physiological factors referred to, and it is urged that this affords strong evidence in favour of the lateral fold theory.

WE have to chronicle the appearance of a new biological serial, *Broteria*, issued by the College of St. Fiel, Lisbon, and named in honour of the celebrated Lusitanian botanist, Dr. F. d'Avellar Brotero, who died in 1887. Although the new journal will embrace biological subjects of any kind, its special object is the fauna and flora of the district immediately surrounding the College of St. Fiel. In addition to a number of papers not specially connected with the area in question, the present issue contains one on the Lepidoptera of St. Fiel.

THE Manchester Museum has issued a second edition, revised and enlarged by Dr. Hickson, of Prof. Milnes Marshall's admirable descriptive catalogue of the series of embryological models in the collection. Since the appearance of the first edition, the development of the torpedo has been added to the series. Number 9 of *Notes* from the Manchester Museum is devoted to observations on the nomenclature and identification of the British cephalopods, by Mr. W. E. Hoyle, reprinted from the *Journal of Conchology*. The author shows that the substitution of the name *Polypus* for the familiar *Octopus*, although much to be regretted, is inevitable, unless priority in nomenclature is to be altogether discarded.

"THE Solution of the Eel Question" is the title of a highly interesting paper, by Dr. C. H. Eigenmann, published in vol. xxiii. of the *Transactions* of the American Microscopical Society. After a summary of the investigations and discoveries of Grassi and Colandruccio in Italy in regard to the developmental history of the European eel, the author records the discovery of the larva ("*Leptocephalus*") of the American eel—a species which differs from its Old-World relative, both in the adult and immature condition, by the smaller number of vertebrae. In August, 1900, Dr. Eigenmann had the opportunity of examining some eels' eggs from the surface of the Gulf Stream—the first taken elsewhere than in Italy—which there is every reason for regarding as those of the conger-eel. To the larval form of the American eel, the author—somewhat unnecessarily, in our opinion—applies the name *Leptocephalus grassii*. In discussing the question whether eels ever breed in fresh water, the author states that while there is nothing inherently impossible in this, yet no decisive evidence of its occurrence has been hitherto recorded. No eels' eggs have at present been taken in fresh water, and the statement that eels found in land-locked basins must of necessity breed there is by no means conclusive.

WE have received a copy of *The Scientific Roll and Magazine of Systematised Notes* (Bacteria, vol. i. No. 6), conducted by Mr. Alexander Ramsay. It contains a few notes on various bacteriological subjects culled from various authors, and an essay on specific descriptions.

IN its issue for November 29, the *Lancet* publishes as a supplement an exhaustive account of the manufacture and nature of Cognac brandy. A number of analyses are given showing how brandy differs from other spirits and indicating how the genuine may be distinguished from the spurious. The former is the product of distillation and maturation of a grape wine, the latter is derived from potato or grain spirit. The subject is of considerable importance from a medicinal point of view.

THE Public Health Department of the City of London directs attention (Report of the Medical Officer of Health, No. 52) to the filthy and dangerous habit of indiscriminate spitting, the chief source, probably, of tuberculous infection. Many cities in the United States, Canada, Australia and in Europe have made the habit a penal offence, and the Corporations of Liverpool, Manchester and Glasgow and the County Council of Glamorgan have bye-laws prohibiting it in public places. The Medical Officer for the City suggests that similar powers should be obtained by the Corporation of London for dealing with it.

NEW editions have been published of "Palæontology, Invertebrate," by Mr. Henry Woods (Cambridge University Press) and "Maps, their Uses and Construction," by Mr. G. James Morrison (Edward Stanford). The former is the third edition and Mr. Morrison's book is a second edition, which has been revised and enlarged.

THE twenty-fourth annual volume of the *Proceedings* of the United States National Museum, published under the direction of the Smithsonian Institution, contains, like all its predecessors, an abundance of valuable information on anthropological, biological and geological subjects. It is impossible in this place to refer to each of the separate contributions. Messrs. Jordan and Snyder review many classes of the fishes of Japan, separate papers being given to the discobolous, gobioid, gymnodont, hypostomide, lophobranchiate, labroid, salmonoid and trachinoid fishes. Messrs. Wirt Robinson and M. W. Lyon provide an annotated list of mammals collected in the vicinity of La Guaira, Venezuela, while Dr. Leonhard Stejneger deals with the batrachians and reptiles of the same locality. In another paper, the last named author describes a new bullfrog from Florida and the Gulf Coast. Mr. D. White gives an account of two new species of algæ of the genus *Buthotrephis*, from the Upper Silurian of Indiana. The fossil fresh-water shells of the Colorado desert form the subject of a paper by Dr. R. Stearns. The humming-birds of Ecuador and Colombia are catalogued by Mr. H. C. Oberholser. Illustrations and descriptions of new, unfigured or imperfectly known shells, chiefly American, in the U.S. National Museum are given by Mr. W. H. Dall. The larks of the genus *Otocoris* are described in detail by Mr. H. C. Oberholser. Many of the papers are accompanied by numerous admirable illustrations, those connected with Mr. Oberholser's paper being especially good.

THE additions to the Zoological Society's Gardens during the past week include a Patas Monkey (*Cercopithecus patas*) from West Africa, presented by Mr. E. Chaplin; a Virginian Eagle Owl (*Bubo virginianus*), a Mexican Eared Owl (*Asio mexicanus*) from Argentina, presented by Miss Irene Thornton; a Graceful Ground Dove (*Geopelia cuneata*) from Australia, presented by Miss Cooper; a Glass Snake (*Ophiosaurus apus*) European, presented by Mr. C. H. Rawlins; a Derbian Wallaby (*Macropus derbianus*) from Australia, deposited; four Black-necked Swans (*Cygnus nigricollis*) from Antarctic America, received in exchange.

OUR ASTRONOMICAL COLUMN.

NEW COMET 1902 d (GIACOBINI).—A telegram from Kiel, dated December 3, announces that the fourth new comet of this year was discovered by M. Giacobini at Nice on December 2d. 12h. Its position at 10h. om. (Nice M.T.) was R.A. = 7h. 17m. '6, Dec. = 1° 58' S., and it is moving in a north-westerly direction. A second telegram, dated December 4, says that the comet was observed by Herr Graff at Hamburg on December 3d. 11h. '5, and its position for 15h. om. (Hamburg M.T.) was R.A. = 7h. 17m. '4, Dec. = 1° 51' S. The daily movement in declination is +3', and the projected path of the comet passes near to the border line between the constellations Gemini and Orion.

NO. 1728, VOL. 67]

THE VARIABILITY OF α ORIONIS.—From an examination of his observations of the comparative magnitudes of Betelgeux and β Orionis which he has made during this year, Herr J. Plassman has confirmed the recent variation of magnitude in the former star, and he considers that the peculiarities of the variations merit further and continuous attention on the part of variable-star observers (*Astronomische Nachrichten*, No. 3830).

ACTIVITY OF THE LUNAR CRATER LINNÉ.—In *Circular* No. 67 of the Harvard College Observatory, Prof. E. C. Pickering gives the micrometric measures of the bright spot surrounding Linné which were made at Harvard by Prof. W. H. Pickering, using the 15-inch equatorial, before and after the passage of the earth's shadow in the eclipse of October 16.

These measures show that the bright spot has materially increased in size since similar measures were made in 1898 and 1899, and, further, that the change in size during the passage of the umbra was surprisingly great, so great that Prof. W. H. Pickering found it necessary to reassure himself that the object he was measuring was indeed Linné. This increase of size amounted to 2".75, instead of 0".14 obtained by the same observer during the eclipse of 1899 (*Popular Astronomy*, vol. viii. p. 58).

Prof. E. C. Pickering attributes the change in the normal size to increased activity on the part of the crater, and the large increase of diameter during the eclipse to the fact that, owing to this increased activity, there was on this occasion more moisture around the crater to condense.

The increase in normal size was confirmed by measures made on October 20, when the spot had begun to shrink owing to the increased amount of evaporation in the fierce sunlight, for the value obtained then (4".61) was sensibly larger than that obtained (3".41) during a similar phase in 1898.

REDETERMINATIONS OF THE VELOCITY OF LIGHT AND THE SOLAR PARALLAX.—A communication from M. Perrotin to No. 21 of the *Comptes rendus* describes the experiments which have been made recently, at the Observatory of Nice, to redetermine with greater accuracy the velocity of light, using the toothed-wheel method of Fizeau under improved conditions.

In previous experiments, the beam of light was made to travel a distance of 12km. (7.452 miles) and back, but in the recent experiments it was reflected from a mirror placed at a distance of 46km. (28.566 miles) from the source, an objective of 0.76m. diameter being used at the plane of emission and one of 0.38m. diameter as the collimator.

As a result of 1109 observations, the final value obtained for the velocity was 299,880km. (about 186,225.5 miles) per second, and the probable error is less than 50km. per second.

In addition, M. Perrotin also gives the final value obtained for the solar parallax, from observations of the planet Eros, made at Nice, as $8''.805 \pm 0''.011$, and from this deduces a value of $20''.465$ for the "constant of aberration," thus confirming the value adopted by the International Astronomical Conference of 1896.

THE "ANNUAIRE ASTRONOMIQUE."—This year-book of astronomy for 1903, compiled by M. Camille Flammarion and published at the low price of 1.50 francs, is one of the most complete and useful books of its kind. It gives practically all the data required by the amateur astronomer or meteorologist, amongst which may be mentioned the solar, lunar and planetary elements for the year, the various phenomena such as eclipses, occultations, meteors, comets, &c., tables of the positions, distances and proper motions of the brighter stars, particulars of double stars, many useful meteorological tables, and a valuable résumé of the more important astronomical and meteorological events of 1902, the whole being freely illustrated by interesting photographs and curves.

METEOROLOGY AT GREAT ALTITUDES.¹

AN International Aeronautical Congress was held at Berlin, May 20 to 24, 1902, on the occasion of the third meeting of the International Committee for Scientific Aeronautics, appointed by the Paris Meteorological Conference of 1896. Of this committee there were present the president, Prof. Hergesell, of Strasburg, Prof. Assmann and Mr. Berson, of Berlin, General

¹ Abridged from a Report contributed by Mr. A. Lawrence Rotch to the U.S. *Monthly Weather Review* for July.